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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/698,323	10/31/2003	Mark Buchler	ITL.1025US (P16712)	9811
21906 7590 04/10/2007 TROP PRUNER & HU, PC 1616 S. VOSS ROAD, SUITE 750 HOUSTON, TX 77057-2631			EXAMINER RIGGLEMAN, JASON PAUL	
			ART UNIT	PAPER NUMBER
			1746	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/10/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/698,323

Applicant(s)

BUEHLER, MARK

Examiner

Jason P. Riggelman

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 March 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's reply filed on 3/28/2007 is acknowledged. Current pending claims are 1-23. Claims 24-34 are canceled. Claims 1-23 have been previously presented or are original.
2. Applicant's arguments, filed 3/28/2007, have been fully considered and are persuasive in regards to the 102 (b) rejection of claims 2-4, 6-8, 11-12, 14, 16-18, and 22-23 over Wang et al. (US Patent No. 6638143). These rejections are withdrawn.
3. Applicant's arguments, filed 3/28/2007, have been fully considered and are not persuasive in regards to the 102 (a) rejection of claims 1, 5, 9-10, 13, 15, and 19-21 over Wang et al. (US Patent No. 6638143). These rejections are maintained; however, a previous publication of the reference is used --- Wang et al. (US Patent Application Publication No. US 2002/0077035) making the rejections 102 (b).
4. The applicant argues that Wang et al. fails to teach attaching ligands along a polymer bristle – because there is no bristle; attaching ligands to make a hydrophilic property; attaching ligands to make an attraction to a specific material; and attaching ligands to change the zeta-potential. The examiner disagrees with the applicant on these points. Specifically, Wang et al. teaches a semiconductor cleaning brush (bristles inherent) with a polymer scrubbing element having a plurality of fixing ligands capable of complexing/chelating materials, paragraph [0008]. The ion exchange material has electrically charged groups (ligands) capable of forming complexes with anion or cations; therefore, changing the zeta-potential (surface charge) to positive or negative is

inherently taught, paragraph [0035]. Also, it is inherent that a polymeric material that functions to complex cations or anions is hydrophilic due the polarity of the surface.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 10 recites the limitation "the" in "zeta-potential". There is insufficient antecedent basis for this limitation in the claim.

7. Claims 20-21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. A method of using a brush having ligands having a (positive or negative) zeta-potential is unclear. A zeta-potential is generally considered a measurement of the electrical potential of a particle (such as a colloid) in a solution. It is unclear how a brush, a macroscale object, or even ligands – which are attached to the polymer backbone comprising the brush bristle can have a zeta-potential. For purposes of examination, this is assumed to be --- a method of using a brush having ligands which change the surface charge of the brush bristle in a given media.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 1, 5, 9-10, 13, 15, and 19-21 are rejected under 35 U.S.C. 102(b) as being unpatentable by Wang et al. (US Patent Application Publication No. US 2002/0077035).

10. Wang et al. teaches a semiconductor cleaning brush (bristles inherent) with a polymer (ion exchange material) scrubbing element having a plurality of fixing ligands capable of complexing/chelating materials, paragraph [0008]. The ion exchange materials has electrically charged groups (ligands) capable of forming complexes with anion or cations; therefore, changing the zeta-potential (surface charge) to positive or negative is inherently taught, paragraph [0035]. Also, it is inherent that a polymeric material that functions to complex cations or anions is hydrophilic due the polarity of the surface.

11. Claims 1, 3-20, and 22-23 are rejected under 35 U.S.C. 102(b) as being unpatentable by Andros (US Patent No. 6033486).

12. Andros teaches a method for attaching cationic ligands along a polyvinyl alcohol polymer bristle of a brush (nub 65), Fig. 4, to form a semiconductor cleaning brush (Column 7, Lines 44-51). A coupling agent (epoxide 2,3-epoxytrimethylammonium chloride) is used to attach the positively charged ammonium ligand (Column 5, Lines 0-10). The cationic ligands are hydrophilic and provide attraction to a specific material—specifically particles of negative zeta-potential (Column 7, Lines 63-67) (Column 2, Lines 61-67). Andros teaches attaching a ligand having a subchain to the polymer — Fig. 3 — note bonded carbon atom 44 linking polymer chain 42 to subchain 43. The ligand can be considered the crosslinked polymer in Fig. 3; therefore, having a two

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carbon minimum subchain length. The subchain is provided with a moiety – ammonium ligand – providing a property to the ligand. The cationic ligand is necessarily providing one of the three properties --- inert, reducing, or oxidizing depending on the medium and the chemical species in question – it may be any of the three and is not independent of the cleaning solution and particles and contaminants contained therein. It should be noted that polyvinyl alcohol is soluble in water – the cross-linking of the polymer forms the micro sponge which is insoluble, also the degree of cross-linking (or ligand attachment to the backbone) determines the hydrophobicity (Column 4, Lines 0-65).

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Andros (US Patent No. 6033486), as applied to claim 1 above, and further in view of Sau (US Patent No. 5036137).

15. Andros teaches the addition of a ligand to a PVA bristle to effectively clean hydrophobic particles; however, Andros does not teach a hydrolysis reaction. Sau teaches the modification of polyvinyl alcohol polymer (naturally water soluble) with a silane coupling agent (which adds via a hydrolysis reaction) to effect cross-linking or to functionalize the polymer backbone with various ligands – effecting hydrophobicity

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(Column 2, Lines 25-68). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Andros with Sau to create an effective polymer bristle for removing hydrophobic particles from wafers.

Conclusion

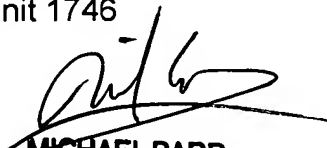
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason P. Riggleman whose telephone number is 571-272-5935. The examiner can normally be reached on M-F, 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr can be reached on 571-272-1414. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JPR

Jason P Riggleman
Examiner
Art Unit 1746


MICHAEL BARR
SUPERVISORY PATENT EXAMINER

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